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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,061	10/31/2003	Ben D. Roberts	ITL.103US (P17101)	2582

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Timothy N. Trop  
TROP, PRUNER & HU, P.C.  
Suite 100  
8554 Katy Freeway  
Houston, TX 77024

EXAMINER
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TRA, TUYEN Q

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/699,061

Applicant(s)

ROBERTS, BEN D.

Examiner

Tuyen Q Tra

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

**Claim Rejections - 35 USC § 112**

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 11, 21, 29 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites "intensity value of the pixels" which derives claim to an indefinite. The pixels themselves do not have intensity value. An appropriate correction or clarification is required.

Claims 2-10, 12-20, 22-28, 31-33 are rejected because they are dependent on at least one of the above rejected claims.

**Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1, 7, 11, 17, 21, 27 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Ernstoff et al. (U.S. Pat. 5,903,323 A).

- a) With respect to claims 1 and 11, Ernstoff et al. discloses a full color sequential image projection system incorporating time modulated illumination in Figure 1 comprising of a mirror array (item 15) to form a projected image comprising pixels, a dimension of the array (15) being

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associated with gray scale intensity value of the pixels; and a circuit (item 20) to, for each pixel, control the mirror array to selectively direct reflected light to combiner (lens 17) from at least two mirrors of the array to regulate an intensity of the pixel (col. 5, lines 1-7)

b) With respect to claims 7, 17 and 27, Ernstoff et al. further discloses wherein a different dimension of the array is associated with pixel positions of projected image.

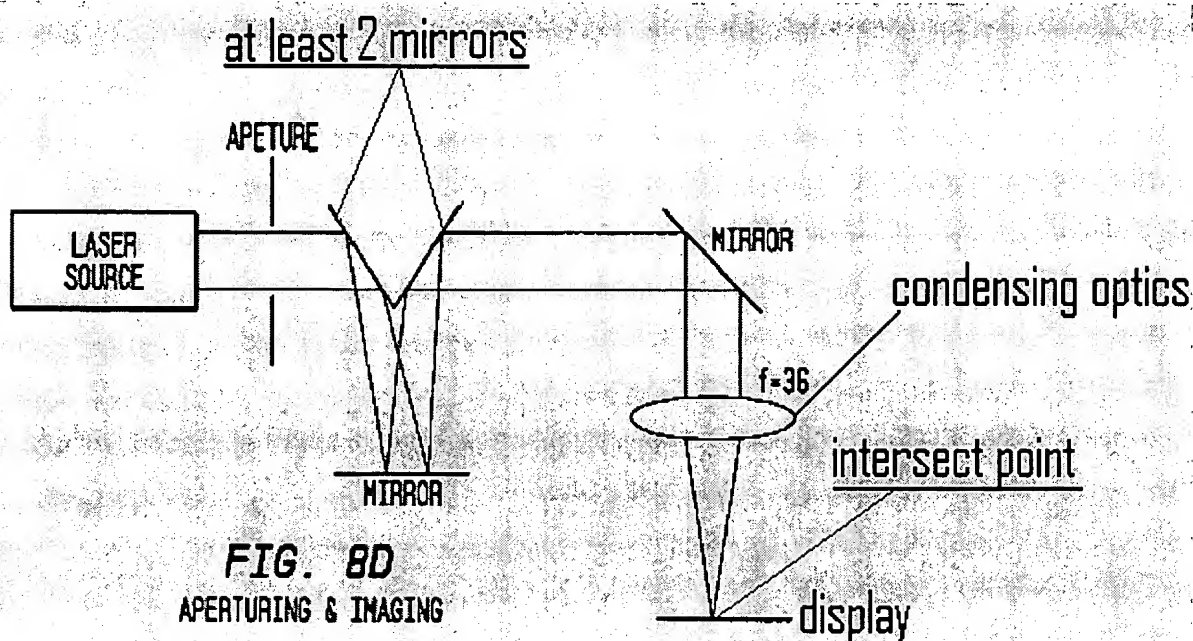
c) With respect to claim 21, Ernstoff et al. discloses a full color sequential image projection system incorporating time modulated illumination in Figure 1 comprising of condensing optics, a mirror array (item 15) comprising pixels, a dimension of the array being associated with intensity values of the pixels; and a circuit (item 20) to, for each pixel, control the mirror array to selectively direct reflected light from the mirror array into the condensing optics from at least two mirrors of the array to regulate an intensity of the pixel (col. 5, lines 1-7)

d) With respect to claim 30, Ernstoff et al. discloses a full color sequential image projection system incorporating time modulated illumination in Figure 1 comprising of a computer in Figure 1 and inherently there is storage medium for storing instructions to cause computer to control a mirror array to produce a projected image, the array comprising pixels and a dimension of the array being associated with intensity values of the pixels; and for each pixel of the image control the mirror array to selectively direct reflected light from the mirror array in an optical path toward the projected image from at least two mirrors of the array to regulate an intensity of the pixel (col. 5, lines 1-7).

4. Claims 1, 2, 4, 6, 8, 11, 12, 14, 16, 18, 21, 22, 24, 26 and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Brandinger et al. (U.S. Pat. 6,605,796 B2).

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a) With respect to claims 1 and 11, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a mirror array to form a projected image comprising pixels, and a circuit to, for each pixel, control the mirror array to selectively combine reflected light from at least two mirrors of the array to regulate an intensity of the pixel (see below Figures).



b) With respect to claim 21, Brandinger et al. discloses in Figure 8D comprising of condensing optics, a mirror array; and a circuit to, for each pixel, control the mirror array to selectively direct reflected light from the mirror array into the condensing optics from at least two mirrors of the array to regulate an intensity of the pixel (Figure 1 illustrated an controller for DMD as an computer controller, col. 5, lines 5-9 discloses purpose of modulating intensity of mirror pixels).

c) With respect to claims 2, 12 and 22, Brandinger et al. further discloses in Figure 8D wherein, for each pixel, the circuit controls the mirror array to selectively tilt the at least two

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mirrors to reflect light into an optical path that intersects a location of the pixel to regulate the intensity of the pixel.

d) With respect to claims 4, 14 and 24, Brandinger et al. further discloses in Figure 8D wherein each pixel of the projected image is uniquely associated with at least two mirrors of the array.

e) With respect to claims 6, 16 and 26, Brandinger et al. further does not discloses the use of pulse width modulation to regulate the intensity of each pixel.

f) With respect to claims 8 and 18, Brandinger et al. further discloses in Figure 8D wherein optics to, for each pixel, merge optical paths extending from said at least two mirrors into a single optical path that intersects a location of the pixel.

g) With respect to claim 30, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a computer in Figure 1A and inherently there is storage medium for storing instructions to cause computer to control a mirror array to produce a projected image, and for each pixel of the image control the mirror array to selectively direct reflected light from the mirror array in an optical path toward the projected image from at least two mirrors of the array to regulate an intensity of the pixel.

### **Claim Rejections - 35 USC § 103**

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claims 29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandinger et al. (U.S. Pat. 6,605,796 B2) in view of Hewlett(U.S. 6,771,411 B2).

a) With respect to claim 29, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a mirror array to form a projected image comprising pixels, and a circuit to, for each pixel, control the mirror array to selectively combine reflected light from at least two mirrors of the array to regulate an intensity of the pixel (see below Figures).

However, Brandinger et al. does not disclose a processor coupled to the mirror array and a flash memory storing instructions for processor to control the mirror array. Within the same field of endeavor, Hewlett teaches a programmable light beam shape altering device using programmable micromirrors with teaching of a processor and a flash memory for storing instructions for the processor to control the mirror array (see Figure 5).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the acoustic imaging apparatus with mirror array such as disclosed by Brandinger et al., with a processor and a flash memory used for storing instruction to control the mirror array such as discloses by Hewlett for purpose of controlling mirror array therein the image display.

b) With respect to claim 31, Brandinger et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a computer in Figure 1A and inherently there is storage medium for storing instructions to cause computer to control a mirror array to produce a projected image, and for each pixel of the image control the mirror array to selectively direct reflected light from the mirror array in an optical path toward the projected

image from at least two mirrors of the array to regulate an intensity of the pixel and the reflected light toward a condensing optic.

However, Brandinger et al. does not disclose a processor to control the mirror array. Within the same field of endeavor, Hewlett teaches a programmable light beam shape altering device using programmable micromirrors with teaching of a processor for controlling the mirror array (see Figure 5).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the acoustic imaging apparatus with mirror array such as disclosed by Brandinger et al., with a processor for controlling the mirror array such as discloses by Hewlett for purpose of controlling mirror array therein the image display.

7. Claims 29, 31 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ernstoff et al. (U.S. Pat. 5,903,323 A), in view of Hewlett(U.S. 6,771,411 B2).

a) With respect to claim 29, Ernstoff et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a mirror array to form a projected image comprising pixels, and a circuit to, for each pixel, control the mirror array to selectively combine reflected light from at least two mirrors of the array to regulate an intensity of the pixel (see below Figures).

However, Ernstoff et al. does not disclose a processor coupled to the mirror array and a flash memory storing instructions for processor to control the mirror array. Within the same field of endeavor, Hewlett teaches a programmable light beam shape altering device using programmable micromirrors with teaching of a processor and a flash memory for storing instructions for the processor to control the mirror array (see Figure 5).



It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the acoustic imaging apparatus with mirror array such as disclosed by Ernstoff et al., with a processor and a flash memory used for storing instruction to control the mirror array such as discloses by Hewlett for purpose of controlling mirror array therein the image display.

b) With respect to claim 31, Ernstoff et al. discloses a laser beam shaping device and apparatus for material machining in Figure 8D comprising of a computer in Figure 1A and inherently there is storage medium for storing instructions to cause computer to control a mirror array to produce a projected image, and for each pixel of the image control the mirror array to selectively direct reflected light from the mirror array in an optical path toward the projected image from at least two mirrors of the array to regulate an intensity of the pixel and the reflected light toward a condensing optic.

However, Ernstoff et al. does not disclose a processor to control the mirror array. Within the same field of endeavor, Hewlett teaches a programmable light beam shape altering device using programmable micromirrors with teaching of a processor for controlling the mirror array (see Figure 5).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct the acoustic imaging apparatus with mirror array such as disclosed by Ernstoff et al., with a processor for controlling the mirror array such as discloses by Hewlett for purpose of controlling mirror array therein the image display.

c) With respect to claim 33, Ernstoff et al. further discloses wherein a different dimension of the array is associated with pixel positions of projected image.

**Allowable Subject Matter**

8. Claims 3, 5, 9, 10, 13, 15, 19, 23, 25 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims.

The reason for the indication of allowable subject matter is that (claims 3, 13, 23) wherein, for each pixel, the circuit controls the mirror array to cause a greater number of said of at least two mirrors to reflect light into the optical path for a higher intensity level than a number of said of at least two mirrors that reflect light into the optical path for a lower intensity level; (claims 5, 15, 25) each pixel of the projected image is associated with a number of mirrors of the array substantially equal to the number of potential gray levels of the pixel; (claims 9, 19) the optics compresses a two-dimensional image formed from light reflected from the mirror array into a one-dimensional sub-image of the projected image; (claims 10, 28) for each pixel, the intensity of the pixel is indicated by a multiple bit digital value and mirrors of the array are organized into different groups, each group of minors being associated with a different bit of the digital value;

9. Claim 20 would be allowable if rewritten to overcome the Claim Objection set forth in this Office action and to include all of the limitations of the base claims and any intervening claims. The reason for the indication of allowable subject matter is that, for each pixel, the intensity of the pixel is indicated by a multiple-bit digital value and the mirrors of the array are organized into different groups, each group of minors being associated with a different bit of the digital value.

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10. Claim 32 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The reason for the indication of allowable subject matter is that further comprising instructions to cause the processor to group mirrors of the array into groups of multiple mirrors, each group being associated with a different pixel of the projected image and the mirrors of each group collectively forming a gray scale intensity for the associated pixel disclosed in the claims is not found in the prior art.

RESPONSE TO APPLICANT'S ARGUMENT

Applicant's arguments with respect to claims 1, 11, 21 29 and 30 have been considered but are moot in view of the new ground of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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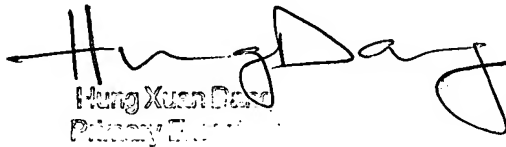
**Conclusion**

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (571) 272-2343. The examiner can normally be reached on Monday to Thursday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (571) 272 - 2328. The fax number for this Group is (703) 872-9306.

tt

November 10, 2004

  
Hung Xuan Dao  
Primary Examiner